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Studies on spiroboloid millipeds. XIX.

Thyroproctus, an exceptional genus in the Rhinocricidae.

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ABSTRACT

A brief taxonomic review of *Thyroproctus* with redescriptions and illustrations of the two included species, both endemic on Jamaica. Despite the similarity of the genitalia to those of most other American species of Rhinocricidae, the genus is provisionally kept separate on the basis of the highly modified hypoproct to avoid extension of the name *Thyroproctus* to include the numerous species currently referred to *Anadenobolus*.

PREFACE

Species of the pantropical family Rhinocricidae have indulged in about as many modifications of basic peripheral structure as possible: great variation in the size and shape of antennae and the number of apical sensory cones; presence or absence of scobinae and, if present, their size, shape, and distribution; number of body rings; spiniform projection of the epiproct; presence of dorsal spines on the paraprocts; presence or absence of ventral tarsal pads in males; modification of anterior male coxae. By contrast, there is relatively little modification in basic gonopod pattern, and when it does occur, the greatest diversity seems centered in the West Indies.

What is surely the most extreme body specialization so far known in the family is encapsulated in the second oldest generic name based on a rhinocricid: *Thyroproctus* Pocock, 1894. Derived from the Greek elements *thyreos* (large, oblong shield) and *proctos* (anus), the name alludes to the shape of the hypoproct, precisely described by Pocock as "very large, thickened, and transversely elongate." The genus was based on a new species, *townsendi*, known from a sample taken at an unspecified locality on Jamaica. The original description was concise and very

brief, with several drawings of the posterior end made with low magnification.

Subsequently – two decades later – R. V. Chamberlin (1918) described a second species, *Thyroproctus cinchonianus*, from a small series taken in the Blue Mountains by C. T. Brues. The description of this species was fairly detailed, but without illustrations. Since more recent papers about Jamaican millipeds (e.g., Loomis, 1975) did not report any new material of either species, our knowledge of the genus has not materially advanced beyond what Pocock knew in 1894. The genus was not mentioned in Brolemann's essay on spiroboloid classification (1914). It was however admitted to the Rhinocricidae in Attems' survey of Indoaustralian myriapods (1914) and his overall classification of 1926, in both of which the modified hypoproct was used as the generic criterion.

In 1952, I received an extensive collection of Jamaican millipeds from the Science Museum of the Institute of Jamaica, which included material of both *T. townsendi* and *T. cinchonianus*. Descriptions and drawings of both were prepared for a planned regional synopsis of the island's milliped fauna, an enterprise which eventually went aground on the reef of rhinocricid taxonomy and was never completed. Most of the identified material was returned to the Institute and my interest in *Thyroproctus* went into an eclipse. Incidentally, during a short visit to Jamaica in 1977, I picked up an adult male of what appears to be *townsendi* and fortuitously had material of *Thyroproctus* available when its generic status came into question in connection with another project.

The identity of *Rhinocricus* itself, another enigma of long tenure, was settled fairly conclusively by me in 1960, when the name was restricted to the type species *parvus* Karsch of Porto Rico and several apparently congeneric species in Cuba. This exclusion had the effect of orphaning the great majority of species which had been described as "*Rhinocricus*" and never transferred to any of the scattering of allied genera (e.g., *Eurhinocricus*, *Argentocricus*) that are currently considered valid. How to accommodate these homeless species is a difficult problem, already mentioned in my "Classification" (1980: 76). As an interim solution, Mauries (1980: 1088) has adopted the third oldest rhinocricid generic name, *Anadenobolus* Silvestri, 1897, to encompass at least the Antillean species that were displaced by the 1960 fixation of *Rhinocricus*.

The most vexing problem has not been settled, however. In virtually all other helminthomorphous millipeds, genera have been defined almost exclusively on characters of the male genitalia. Since these appendages tend to observe a uniform basic configuration throughout the Rhinocricidae, various authors have resorted to every imaginable combination of the structural variables mentioned in the first sentence (as well as some rather negligible gonopodal differences) to achieve something like generic groupings. The phylogenetic artificiality of these menages is not difficult to contemplate. But not even gonopodally-based groups are quite satisfactory. Are the "simple" attenuated posterior gonopods that appear in the West Indies (*Rhinocricus*), South America (*Andocricus*), and Papuasias (*Acladocricus*) the descendants of a common ancestor, or homoplastic reduction products? Other characters do not offer much of an insight into this problem.

The gonopods in *Thyroproctus* (Figs. 1, 2) are notable for their universality: they could without any reservation be regarded as strictly congeneric with the species from Guadeloupe that Mauriès considered to be Porat's *politus*, the type species of *Anadenobolus*. If rhinocricid genera are to be gonopod-based, *Thyroproctus* is the correct generic name for the majority of New World rhinocricids.

Looking at the posterior end of a specimen of *townsendi*, however, may engender some hesitancy. Here is a structural departure of considerable magnitude, not approached anywhere else in the family or order (Figs. 3, 4). Perhaps it has greater systematic importance than mere numbers of antennal sensoria, or dorsally acuminate paraprocts. Perhaps an exception, a purely subjective dispensation, can be justified to maintain this small Jamaican endemic group as an entity unto itself. Strict observation of "gonopod genera" is an option with its own built-in set of problems. In the belief that only a consensus of concerned investigators will solve the dilemma, I propose here to take the stand that *Thyroproctus* merits special consideration as a valid local genus, the recognition of which will not pre-empt the validity of other Antillean genera with similar gonopods.

For the benefit of present and future colleagues I provide here a severely condensed version of my original accounts of the genus and its two species, based on Jamaican material. Such information is in any event necessary for evaluating the zoological and nomenclatorial status of these animals.

Thyroproctus.

Thyroproctus Pocock, 1894, Journ. Linnean Soc. London, 24: 506. Type species: *T. townsendi* Pocock, by monotypy.

DIAGNOSIS: A rhinocricid genus characterized by modification of the terminal segment: hypoproct enlarged, incrassate, transversely elongated, preceded by a prominent deep transverse groove; paraprocts flat, without margination, lying at nearly a right angle to median body axis; epiproct not distomedially produced, its edge nearly transverse (Figs. 1, 2). Antennae with four apical sensory cones. Segments with two transverse sulci, the posterior indistinct, anterior prominent and deeply impressed entirely around the segment, curved forward in front of ozopores.

Gonopods similar to those of most other rhinocricid genera (Figs. 3, 4), the telopodite of the posterior gonopods distally laminate and broadened beyond midlength; solenomere nearly as long as acropodite.

DISTRIBUTION: The genus is endemic to the eastern third of Jamaica.

REMARKS: *Thyroproctus* is one of the most disjunct of all spiroboloid genera in the modification of the posteriormost segments. The two species are very similar in terms of gonopod structure, but differ substantially in a number of peripheral characters to be assured of full specific status. Although considerable work remains to be done in defining their ranges, it appears at present that *cinchonianus* is more partial to higher elevations in the Blue Mountains north of Kingston, while *townsendi* occurs at lower elevations further to the east.

Two interesting cases of mimicry may be noted: *Anadenobolus newtonianus* and *Thyroproctus cinchonianus* have similar striped color patterns and appear to be sympatric; *A. excisus* and *T. townsendi* are both uniform blackish and occur together at the easternmost part of the island.

It is also noteworthy that relatively extensive collecting throughout Jamaica in recent years has not disclosed additional species of this genus (e.g., Loomis, 1975).

KEY TO THE SPECIES OF THYROPROCTUS

- Uniform black; metazona of each body segment elevated and imparting a distinctly moniliform or annular appearance; scobinae present; adults longer than 35 mm
 **townsendi**
- Body dark laterally, dorsum lighter with black middorsal stripe; metazona not elevated, the body therefore parallel-sided; scobinae absent; adults less than 35 mm long
 **cinchonianus**

Thyroproctus townsendi Pocock

Figures 1-4

Thyroproctus townsendi Pocock, 1894, Journ. Linnean Soc. London, 24: 506, pl. 37, figs. 6, a-c. Holotype ♂ (Brit. Mus. Nat. Hist.) labeled only "Jamaica" (T. Townsend).

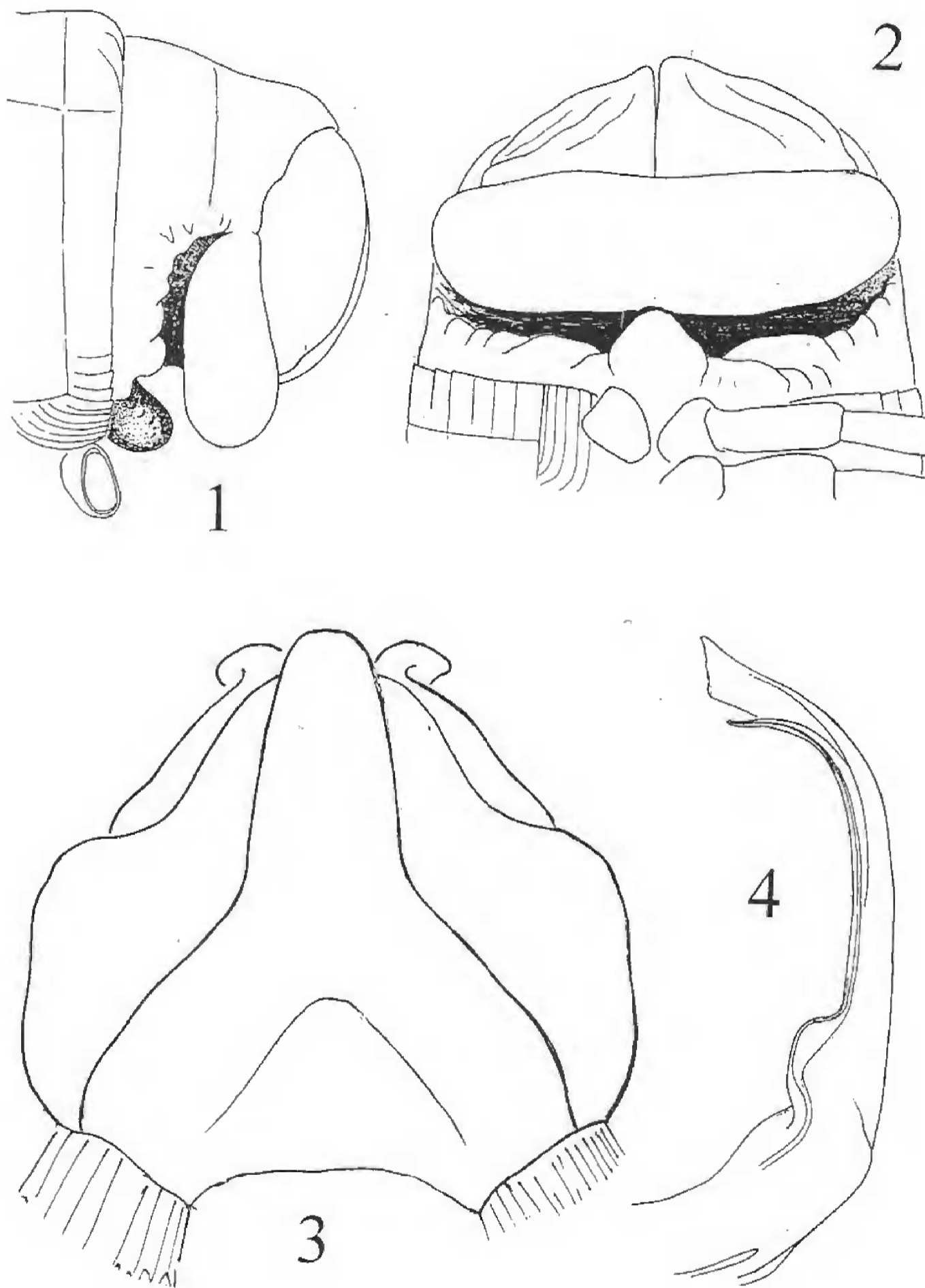
DIAGNOSIS: The uniform black color, annulate appearance of the segments, and presence of scobinae readily distinguish this species.

DESCRIPTION (specimens from Corn Puss Gap, St. Thomas): Color entirely dark brownish-black to piceous; legs and antennae tan; front of head light brown with median frontal black mark.

Body stout, W/L ratio about 11%; head and collum much wider than succeeding segments, body otherwise nearly equidiametric back to last several segments.

Front of head generally rounded and smooth, slightly flattened between antennae and minutely papillose in males, finely striate transverse in both sexes. Clypeal groove distinct. Labral setae varying from 6-6 (male) to 10-10 (female). Head strongly margined below antennae; latter small and stout, not extending back beyond middle of collum, 6th article largest, 4th and 5th somewhat smaller than proximal three; antennomeres almost glabrous, only a few scattered setae present except on distal half of 6th and over entire 7th. Four apical sensory cones. Front surface of antennal socket transverse striate. Ocellaria normal in size and shape, with about 25 ocelli in six rows.

Collum smooth, broadly convex, appearing slightly inflated, lateral ends rounded, with well-defined marginal sulci extending up to level of middle of ocellaria. Second segment prolonged cephaloventrad well beyond middle of ends of collum, but not deeply excavated; surface of lateral ends with a few sharply



FIGS. 1-4. *Thyroproctus townsendi* Pocock. 1, posterior end of body, lateral aspect. 2, posteriormost segments, ventral aspect. 3, anterior gonopods, anterior aspect. 4, left posterior gonopod, mesal aspect. Specimen from Bath Spa, St. Thomas Parish, Jamaica.

defined longitudinal striae.

Succeeding segments finely shagreened, otherwise smooth; primary sulcus indistinct. Metazona strongly elevated, imparting an evident annular appearance. Secondary sulcus deeply impressed entirely around segment, curved forward in front of ozopores. Lower sides of segments with a few indistinct oblique striae.

Epiproct very short, thickened, broadly truncated, equalling but not exceeding paraprocts, latter small, flat, almost transverse. Hypoproct greatly enlarged, transversely elongated, preceded by a very deep groove. Sternal area of penultimate segment with large conspicuous median projection.

Legs short, stout, podomeres in order of decreasing length, 2-3-6-4-1-5; tarsal claw long and slender; ventral tarsal pads present in males. First two pairs of legs of males reduced in size, somewhat incrassate. Coxae of anterior legs without lobes or other modification.

Gonopods of the form shown in figures 4 and 5.

Scobinae present from 8th to about 21st segment, small, transversely elongated, about five or six times as wide as long, separated by about three times a scobinal width. Scobinellae rounded, finely striate, about 1.5-2 diameters apart, present back to 28th segment.

VARIATION: In the series from Corn Puss Gap, three females range from 30.3 to 37.8 mm in length, with 40, 40, and 42 segments; the single male is 37.0 mm long, with 40 segments. In specimens from Priestman's River, six males have 39-41 segments (avg. 40.3) and four females 38-41 (avg. 39.7). Variation in segment number appears to be minimal.

DISTRIBUTION: Eastern part of the Blue Mountains, probably also the John Crow Mountains. The following 16 specimens were examined: *St. Thomas Parish*: Corn Puss Gap, north of Bath, 1♂ 2♀, 25 August 1952, R. P. Bengry. *Portland Parish*: Priestman's River, 7♂, 4♀, 27 November 1951, G. R. Proctor & R.L. Hoffman. 5 miles west of Priestman's River, 1♀, 5-7 February 1952, C. B. Lewis. Bath Spa, 1♂, 5 February 1977, R. L. Hoffman.

Thyroproctus cinchonianus Chamberlin

Thyroproctus cinchonianus Chamberlin, 1918, Bull. Mus. Comp. Zool., 62: 205.

Male holotype ♂ (MCZ) from Cinchona (Plantation), St. Andrew Parish, Jamaica (C. T. Brues).

DIAGNOSIS: Readily separated from *townsendi* by the attractive lineate color pattern, smooth-sided body, absence of scobinae, and much smaller size.

DESCRIPTION (specimen from Clydesdale, St. Andrew Parish): A generally pale species with dark sides and a black middorsal stripe bordered each side by a light band. Under magnification, each segment shows the metazona to be mostly yellow, the mesozona dark up to level of ozopores, dorsad to which is it yellowish white except for a broad cruciform black mark with its base pointed caudad and apex extended anteriorly onto prozona. Front of head pale brown with a black epicranial

mark, diverging ventrally around median clypeal suture; a black margin above each antennal socket; eyes, front edge of collum, middorsal stripe, and caudal half of epiproct black. Legs and antennae yellow.

Structurally very similar to *townsendi* except that metazona are not elevated above level of mesozona, and no scobinae can be detected. Small rounded scobinellae are present back to the 29th segment.

VARIATION: Eight specimens (itemized below) appear to show no geographic variation. Four males vary from 25.8 to 32.1 mm in length, with 37-39 segments. Four females range from 24.3 to 28.6 mm in length, with 35-41 segments.

DISTRIBUTION: Western and middle parts of the Blue Mountains. The following nine specimens have been examined: *St. Andrew Parish*: Clydesdale, 1♀, 19 August 1949, R. P. Bengry; Shooters Hill, 2♀♀ (date lost), G. R. Thompson; Newcastle Road, 2♂♂, 8 December 1946, Thompson. *St. Thomas*: ravine near Abbey Green, 1♂, 1♀, 16 December 1951, G. R. Proctor; Whitfield Hall, 1♂, 13 May 1950, Bengry. *Portland Parish*: Haycock Mountain, above Balcarres P. O., 1♀, 11 June 1953, Proctor.

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